Home work # 06

Name.....

Is the observed sample proportion unusual?

1) Based on previous studies, researchers believe that 6% of children are born with a gene that is linked to a certain childhood disease. If the researchers test 950 newborns for the presence of this gene, would it be unlikely for them to find fewer than 25 children with the gene? Answer by calculating the appropriate z-score. 1) _____

A) Yes, z = -4.41
B) No, z = -4.41
C) No, z = -0.005
D) No, z = -6.59
E) Yes, z = -6.59

Find the mean/standard error of the sampling distribution of the proportion.

2) A candy company claims that its jelly bean mix contains 21% blue jelly beans. Suppose that the candies are packaged at random in small bags containing about 400 jelly beans. Describe the sampling distribution model of the proportion of blue jelly beans in a bag. 2) _____

A) mean = 21%; standard error = 2.0%
B) mean = 21%; standard error = 0.8%
C) There is not enough information to describe the distribution.
D) mean = 79%; standard error = 0.8%
E) mean = 79%; standard error = 2.0%

Provide an appropriate response.

3) Which of the following are true: 3) _____

I) the population distribution is approximately normal for large enough n
II) the sampling distribution of $\bar{x}$ is approximately normal for any n
III) regardless of the population distribution, the mean of the sampling distribution of $\bar{x}$ equals the population mean μ

A) II only B) III only C) I only D) all of these

4) As the sample size increases, which of the following are true: 4) _____

I) the sample mean tends to fall closer to the population mean
II) the sampling distribution of the sample mean $\bar{x}$ approximates the population distribution
III) the standard error decreases

A) all of these
B) II only
C) III only
D) I only
E) both I and III

5) In one region, the September energy consumption levels for single-family homes had a mean of 1050 kWh and a standard deviation of 218 kWh. If 50 different homes are randomly selected, find the probability that their mean energy consumption level for September is greater than 1075 kWh. 5) _____

A) 0.0438 B) 0.2090 C) 0.2910 D) 0.4562 E) 0.4180

6) True or False: A sampling distribution is a distribution for a statistic. 6) _____

Provide an appropriate response.

7) In one region, the September energy consumption levels for single-family homes had a mean of 1050 kWh and a standard deviation of 218 kWh. Describe the center and spread of the sampling distribution of the sample mean for a random sample of 50 single-family homes from this region. 7) _____

A) center = 1050, spread = 92.49
B) center = 1050, spread = 61.66
C) center = 1050, spread = 4.36
D) center = 1050, spread = 30.83
E) center = 1050, spread = 218

8) The gestation time for humans has a mean of 266 days and a standard deviation of 25 days. If 100 women are randomly selected, find the probability that they have a mean pregnancy between 266 days and 268days. 8) _____

A) 0.2119 B) 0.7881 C) 0.5517 D) 0.2881

9) Assume that blood pressure readings have a mean of 120 and a standard deviation of 8. If 100 people are randomly selected, find the probability that their mean blood pressure will be greater than 122. 9) _____

A) 0.8819 B) 0.9938 C) 0.0062 D) 0.8615

10) Assume that the heights of adult Caucasian women have a mean of 63.6 inches and a standard deviation of 2.5 inches. If 100 women are randomly selected, find the probability that they have a mean height greater than 63.0 inches. 10) _____

A) 0.8989 B) 0.0082 C) 0.9918 D) 0.2881

11) Which of the following is <u>true</u> about the sampling distribution of the sample mean? 11) _____

A) The mean of the sampling distribution is always μ.
B) The shape of the sampling distribution is always approximately normal.
C) The standard deviation of the sampling distribution is always σ.
D) All of the above are true.

12) Why is the Central Limit Theorem so important to the study of sampling distributions? 12) _____

A) It allows us to disregard the size of the sample selected when the population is not normal.
B) It allows us to disregard the size of the population we are sampling from.
C) It allows us to disregard the shape of the sampling distribution when the size of the population is large.
D) It allows us to disregard the shape of the population when *n* is large.

Provide an appropriate response.

13) According to an exit poll taken by CNN during the 2008 Democratic Primary in Connecticut, 552 registered voters voted for Hilary Clinton and 598 for Barack Obama. Would you have been willing to predict Obama as the winner? 13) _____

A) Yes, $0.52 > 0.50$
B) Yes, $z = 1.36$
C) No, $z \approx 0$
D) No, $z = 1.36$
E) No, the sample size is too small to make inferences about the population

14) If the proportion of American adults who believe that America is ready for a woman president is 0.70, what are the mean and standard error for the proportion of people who believe that America is ready for a woman president for a sample of size 1000? 14) _____

15) The body temperatures of adults have a mean of 98.6° F and a standard deviation of 0.60° F. If 36 adults are randomly selected, find the probability that their mean body temperature is greater than 98.4° F. 15) _____

A) 0.9360
B) not enough information to determine
C) 0.0228
D) 0.9772
E) 0.8188

Select the most appropriate answer.

16) A population distribution has mean 50 and standard deviation 20. For a random sample of size 100, the sampling distribution of the sample mean has 16) _____

A) mean 50 and standard error 2.
B) mean 50/100 and standard error 20/100.
C) mean 50 and standard error 0.20.
D) mean and standard error that are unknown unless we know the exact shape of the population distribution.
E) mean 50/10 and standard error 20/10.